The Effects of Human Capital Investment On The Black/White Family Income Differential

An Honors Thesis (ID 499)

by

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Since the Moynihan reports, the black/white income differential has been a puzzling question upon which much research has focused. The explanation for this difference ranges from Wilson (1987), who believes it stems from the continual development of the "underclass", to Murray (1984) who believes government programs and income redistribution efforts have made blacks relatively worse off, to Reich, who believes black incomes are relatively low because of exploitation by white "capitalists".

Most studies have used longitudinal data to back their theories and to explain black/white income differential changes over time. Not only have black/white ratios changed over time, there is a variation in the ratio between standard metropolitan statistical areas (SMSAs) at a point in time. It is argued in this thesis that much of this difference is caused by structural differences between the SMSAs. Examples of these differences include family structure, government assistance available, median years of schooling, and the percent of manufacturing industry in a particular SMSA. Differences of these types are difficult to explain in longitudinal studies which usually consider the United States as an entirety. Some general questions to be addressed in this thesis are

> Are there differences in human capital investments between SMSAs? Do these differences affect the black/white income differential?
>
> Are there differences in the industrial structures of the SMSAs? Do these differences affect the income differential?
>
> Are there differences in available public assistance? Do these differences affect the income differential?

Are there differences in family structure? Do these differences affect the income differential?

The thesis will develop as follows: Section II is a literature review, Section III presents the data base and variable definitions, Section IV presents the hypotheses, Section V shows and discusses the results of the regressions, and the conclusion and implications for policy are in Section VI.

Section II: Literature Review

The most read books concerning the black/white income differential are Murray's Loosing Ground, Wilson's The Truly Disadvantaged, and Reich's Racial Inequality. This literature review will look at these three and at several supplemental articles.

Murray spends many chapters presenting data to show that in every phase of life, blacks are behind whites-- from educational attainment to the wages earned. He claims that a large number of blacks do not even try to participate in the work force (p77), but blames almost everything on government policy. Murray says that the government has made it profitable for blacks to behave in short term ways that hurt them in the long term, but this is masked with subsidization and the people do not realize what is happening to them. To test Murray's hypothesis, we have included the variable mean assistance. This variable, taken from the 1980 Census Data, is added to regressions which have poverty and family income as dependent variables to see how much effect government assistance has on these elements. If it is highly

significant and negative, as Murray suggests, his policy prescription of greatly reducing government transfer programs will be supported. If not, we turn to Wilson's contention that it is not mistakes in government welfare policy, rather it is the social and economic environment under which many blacks live that causes black family income to be relatively low.

Wilson believes that years of migration to the suburbs by industry and many middle-income black citizens have left the inner-city blacks with poverty, despair, and no one to look to for an idea of what life should be like. This inner-city "underclass" is defined by Wilson as untrained, unskilled, long-term unemployed, individuals engaged in street crime, and families in long-term poverty (pg8). Wilson contends if the neoconservative Murray is correct, the recent tax changes and lack of AFDC adjustment for inflation should have been an incentive for welfare recipients to work. But that never happened (pg17). From his liberal perspective, Wilson claims that special attention needs to be given to ghetto-specific cultural characteristics such as the relation between joblessness and family structure and joblessness and social dislocations such as crime and teen pregnancy (pg18).

The number of black female-headed households has almost doubled between 1965 and 1980. Wilson believes this is a significant factor especially because the same is not true of white families. The increase in female-headed households has had a significant effect on black family incomes. Eighty percent of black families in 1980 with less than $4000 annual income were

headed by females compared to only 8% of families with household incomes over $25,000 (pg27). Reich, a radical economist, agrees that the increase in female headed households has affected the income differential. The regression model in this thesis includes a variable which measures the percentage of families which are headed by women. This variable is used by comparing the number of families for both blacks and whites to the number of female headed households and the difference of this ratio in relation to the black/white family income ratio.

Family structure is also related to investment in human capital, such as the decision to get an additional year of schooling or the decision to graduate from high school. Wilson notes that more than half of blacks in poverty areas have not finished high school. Coupled with the fact that a majority of poverty families are female headed, there is an indication of a direct correlation between low human capital investment and family structure. In this thesis, family structure, as measured by the percentage of families headed by females, is used as an independent variable predicting the median years of schooling in the SMSA.

An important side effect of the difference between the number of white female headed households and the number of black ones is the effect female labor force participation has on the income differential. Reich (pg66) believes that the rapidly increasing white female labor force participation has hurt the differential because these women are more likely to be married than their black counterparts, and, therefore, their earnings add

to the white median family income, whereas a black woman's earnings are like to be the family income.

Return on education is also a prime concern in this thesis. Human capital is definitely an important factor in income potential, but is it equally important to blacks and whites? If human capital has the same coefficient for both blacks and whites, it is equally important for both. In Labor Economics, Marshall and Briggs state that the human capital investment theory has policy implications that incomes of all workers could be improved by equipping them with more human capital (pg189). They cite the Hudson Institute whose figures indicate that in 1980 only 12.8 years of school were required for current jobs, whereas, in the mid to late 80's 13.5 years will be required for new jobs (pg217). Industry has become more technological and this has hurt blacks who do not have as high a human capital investment rate as whites.

There is some evidence that the industrial structure of an SMSA may be a determinant of black/white income differentials. Hyclak and Stewart (pg311) found in their empirical studies that manufacturing had the greatest effect of all independent variables on the black/white income differential. They note, "...the relative importance of manufacturing as a source of employment is declining over time. This result has significance for future trends in the black/white ratio" (pg310). In this thesis the variables DURDIF (the difference between black and white durable employment) and PDUR (the percentage of total employment in an SMSA concentrated in manufacturing) will measure

the intensity of manufacturing activity in SMSAs.

Another factor in the structure of an SMSA is union membership. Many states have right to work laws which tend to lessen union membership. These states tend to be in the South with a few exceptions. In May of 1980, 34.8% of durable workers were organized according to Marshall, Briggs, and King (fifth edition,pg116). Of significant interest for this thesis is though blacks represented only 12.8% of the 1980 civilian work force, they were 14.9% of unionized workers (pg135). Marshall and Briggs (6th edition, pg358) attribute these statistics to the high concentration that blacks have in fields that are commonly unionized. In their empirical studies, Hyclak and Stewart found that unionization is statistically significant and positive in relation to the black/white earnings ratio. This thesis uses two union factors to measure the effect that union membership has on the black/white income differential. The first, PUNION, measures the percentage of those in the city in a union. The second, PRDUNION, measures the percentage in a production union. Ashenfelter (Masters, 1975, pg30) found unions, especially industrial unions, help blacks do better relative to whites. Data for union membership is limited to the top 94 populated cities, so results for these variables in this thesis are reported separately.

Gordon (1984) does not include an industrial structure variable or a union variable when expanding Rasmussen's income differential model. Ignoring the effect of the migration of blacks to the industrial North is only one problem with Gordon's

model. In his expanded model, he found black political power to be significant in determining the black/white income differential-- however, he uses the number of black congressmen as his black political power proxy. This measure does not state whether these are U.S. Congressman or individual state congressmen. This is a questionable proxy, also, because it does not account for the influence a black mayor or school board member has on the chances of blacks doing well relative to whites.

Because the government is the first institution to be affected by equal opportunity employment laws and is perhaps the most strictly monitored, government employment at all levels could easily affect the black/white income differential. Reich (pg 128) explains that entry wages in public employment are relatively high and that many government workers are low and middle-level white collar workers. It is argued in this thesis that SMSAs which have high percentages of blacks employed in government will have relatively high black/white income ratios.

This thesis and its data set lends itself well to testing Becker's theory of discrimination (McConnell and Brue, 1986) which focuses on the percentage of blacks living in a particular area. Becker believes the higher the concentration, the more the discrimination, which would lead to a lower black/white income differential. In this thesis, the variable black/white population ratio measures the number of blacks compared to the number of whites. There are at least 3000 blacks in every SMSA in the data base, and no more than 20% are enrolled in college.

Significant and negative results will back Becker's theories. Other results (either positive or insignificant or neither) might indicate that other factors are more influential on the differential.

III. Data Base and Variable Definitions

The data base used in this thesis is drawn from the 1980 Census. The advantage of this data base is that SMSA specific data on the number of families, the number of female headed households, median education, industrial structure, and government employment allows for comparisons between cities and regions.

From the data base several variables were selected to test the hypotheses stated in the introduction. These variables are stated and defined in Table 1. The education variables (WMED BMED and BWMEDEDR) are used as both dependent and independent variables. For the first hypothesis, they are used as dependent variables to determine how much effect other factors of the city structure have on human capital investment.

For the second hypothesis, the education variables are used to determine whether return on human capital investment is the same between blacks and whites. The dependent variables BFAMIN, WFAMIN, and BWFAMINR are the proxies for determining the family structure. The independent variables WPGOV, BPGOV and GOVDIF allow for testing of Reich's belief that government work helps the income differential. WDURP, BDURP, PDUR, and DURDIF are all industrial structure variables that show how intensity and

Table 1: Variable Definitions

Variable Name	Definition (all variables pertain to individual SMSAs)
Dependent Variables	
BMED	Black Median Years of School
WMED	White Median Years of School
BWMEDEDR	Black Median School/White Median School
BFAMIN	Black Family Median Income
WFAMIN	White Family Median Income
BWFAMINR	Black Median Family Income/White Median Family Income
Independent Variables	
MASSIST	Mean Government Assistance Received
WPGOV	Number of Whites Employed in Government/Number of Whites Employed
BPGOV	Number of Blacks Employed in Government/Number of Blacks Employed
GOVDIF	Percent of Whites Employed in Government Minus Percent of Blacks Employed in Government
WDURP	Number of Whites Employed in Durable Goods Manufacturing/ Number of Whites Employed
BDURP	Number of Blacks Employed in Durable Goods Manufacturing/ Number of Blacks Employed
DURDIF	Percent Black Durable Employment Minus Percent White Durable Employment
PERDUR	Number Employed in Durable Goods Manufacturing/Number Employed
PUNION	Percent of Workers in a Union in Select SMSAs
PRDUNION	Percent of Production Workers in a Union in Select SMSAs
PBFHEAD	Number of Black Female Headed Households/Number of Black Families
PWFHEAD	Number of White Female Headed Households/Number of White Families
FHEADDIF	Percent Black Female Headed Households Minus Percent White Female Headed Households
PUEMP	Unemployment Rate
WEST	SMSAs in the Western Region--States include Oregon, Utah, Washington, California, Idaho, Montana, Wyoming, Alaska, Nevada, Colorado, Arizona, New Mexico, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and Hawii
NORTH	SMSAs in the Northern Region-- States include Minnesota, Iowa, Missouri, Wisconsin, Illinois, Michigan, Indiana, Ohio, Maine, Vermont, New Hampshire, Maryland, New York, Massachusetts, Connecticut, Rhode Island, Pennsylvania, Delaware, and New Jersey
SOUTH	SMSAs in the Southern Region-- States include Virginia, West Virginia, Kentucky, Tennessee, North Carolina, South Carolina, Arkansas, Texas, Louisiana, Georgia, Alabama, Mississippi, and Florida.
BWPOPR	Number of blacks/Number of whites

Table 2 Mean Values of Dependent Variables by Region
(standard deviations in parentheses)

Dependent Variables	USA	West	North	South
BMED	11.9 (0.667)	12.438 (0.579)	12.056 (.358)	11.446 (.712)
WMED	12.6 (0.293)	12.785 (.244)	12.523 (.299)	12.496 (.260)
BWMEDEDR	0.945 (0.048)	0.973 (.037)	0.963 (.030)	0.916 (.053)
BHSGRAD	53.68 (10.5)	67.926 (10.932)	54.49 (6.395)	47.245 (7.5)
WHSGRAD	69.14 (7.325)	76.97 (6.794)	68.956 (5.558)	66.248 (6.931)
GRADDIF	-15.46 (7.987)	-9.041 (6.618)	-14.464 (6.207)	-19.003 (8.279)
BFAMIN	13244.19 (2516.1)	14317.59 (2692.05)	14452.1 (2337.31)	11589.03 (1503.44)
WFAMIN	21145.51 (2929.83)	21802.15 (3016.27)	22312.92 (2782.59)	19695.83 (2391.40)
BWFAMINR	0.627 (.087)	0.655 (.072)	0.651 (.096)	0.592 (.068)
SAMPLE SIZE	239	39	101	99

Table 3 Mean Values of Independent Variables by Region
(Standard Deviations in Parentheses)

Independent Variables	USA	West	North	South
Labor Supply				
BMED	11.9	12.438	12.056	11.446
	(0.667)	(0.579)	(.358)	(.712)
WMED	12.6	12.785	12.523	12.496
	(0.293)	(.244)	(.299)	(.260)
BWMEDEDR	0.945	0.973	0.963	0.916
	(0.048)	(.037)	(.030)	(.053)
BFLFPR	55.4	57.87	54.87	54.96
	(5.938)	(7.29)	(5.636)	(5.449)
WFLFPR	50.03	52.52	49.82	49.26
	(5.015)	(5.01)	(4.503)	(5.248)
BWFLFPRD	5.37	5.36	5.049	5.703
	(4.841)	(4.956)	(3.941)	(5.598)
MASSIST	2381.14	2650.59	2646.5	2004.28
	(433.61)	(354.06)	(351.04)	(193.23)
Labor Demand Variables				
BPGOV	0.28	0.402	0.247	0.266
	(.273)	(.649)	(.072)	(.071)
WPGOV	0.163	0.175	0.148	0.174
	(.055)	(.053)	(.046)	(.061)
GOVDIF	0.117	0.227	0.099	0.092
	(.260)	(.633)	(.045)	(.036)
BDURP	0.175	0.136	0.256	0.108
	(.134)	(.184)	(.123)	(.056)
WDURP	0.142	0.1	0.202	0.096
	(.083)	(.065)	(.079)	(.046)
DURDIF	0.034	0.036	0.054	0.011
	(.082)	(.169)	(.06)	(.027)
PERDUR	0.153	0.104	0.223	0.102
	(.131)	(.065)	(.167)	(.053)
UNEMP	6.57	6.51	7.38	5.77
	(2.2)	(2.06)	(2.31)	(1.81)
PUNION **	22.82	20.77	28.3	14.65
	(9.938)	(6.21)	(9.155)	(7.435)

Family Structure				
PBFHEAD	0.374	0.301	0.434	0.341
	(.277)	(.075)	(.413)	(.061)
PWFHEAD	0.114	0.115	0.126	0.102
	(.090)	(.012)	(.137)	(.013)
FHEADDIF	0.259	0.187	0.308	0.239
	(.290)	(.074)	(.436)	(.061)
Sample Size	239	39	101	99
**Sample Size	95	29	47	26

availability of jobs in durable goods manufacturing affects the income differential in an SMSA. PUNION and PRDUNION are independent variables that indicate whether unionization in an SMSA affects the differential. The three independent variables PBFHEAD, PWFHEAD, and FHEADDIF represent family structure in the SMSA. Regional variables NORTH, SOUTH, and WEST allow for regressions that look not only for differences between SMSAs, but for differences between regions of the country.

MASSIST allows examination of government transfers in a particular SMSA to see if transfer are an influence on the differential.

The variable BWPOPR allows for testing of Becker's theory and the variable POP indicates whether SMSA size influences the black/white income differential.

IV. The Hypotheses

From the 1980 SMSA specific Census Data, numerous variables were drawn to test two main hypotheses concerning the black/white income differential. Each will be discussed in turn.

The first hypotheses is that higher median level of educational attainment for blacks relative to whites will be found in cities with fewer black female headed households relative to white, a lower percentage of employed blacks in manufacturing jobs relative to whites, a higher percent of employed blacks working for the government relative to whites, and a low black/white population ratio. The hypothesized negative relationship between the percentage of families which

are headed by females is based upon the fact that most female headed households are poor and therefore do not have as many resources to invest in the human capital of their children. The positive relationship hypothesized between educational achievement and government employment results from the fact that the majority of government jobs require at least a high school education. The opposite is true of the manufacturing industry, which has historically not required much human capital investment, therefore a negative relationship is hypothesized between the presence of durable goods manufacturing and educational achievement. The black/white population ratio is included because of the fact that school's with a high concentration of blacks have lower quality of education and thus fewer students who are encouraged to stay in high school or continue their education afterwards.

The second hypothesis is that the black/white income differential will be larger for cities where black educational attainment is high relative to whites after controlling for other important determinants that influence the differential.

In the second hypothesis, the dependent variable is the black/white income differential. The differential has been the focus of research by conservatives, liberals, and radicals-- the literature review cites theories by Murray, Wilson, and Reich respectively. All agree that there is a problem with the fact that black earnings are low relative to whites, but causes and solutions vary. This thesis will test their theories of why the difference exists and will attempt to draw some conclusions.

Black/white median education is used as an independent variable in determining the differential. This will determine if Marshall and Briggs are correct in their theory that human capital investment improves the black/white income differential. Marshall and Briggs (pg189) contend that the incomes of all workers could be improved by equipping them with more human capital.

The non-educational variables which will be included in the model which tests hypothesis 2 include FHEADDIF, PERDUR, DURDIF, BWPOPR, PGOV, GOVDIF, BWFLFPRD, and MASSIST.

As mentioned in the literature review, the number of female-headed households is included as an independent variable to test Wilson and Reich's contention that a high percent of black female-headed households hurts the black/white income differential.

Intensity of manufacturing in an SMSA is included to test Hyclak and Stewart's theory that manufacturing and its decline will have a great and negative effect on the differential.

The black/white population ratio is included as an independent variable to test Becker's theory of discrimination. A negative and significant result is expected.

The percentage of government employment is included to test Reich's theory that high government employment helps the differential because these jobs tend to be high paying even at the entry level where blacks are often found.

The female labor force participation rate ratio is included as an independent variable in testing the second hypothesis to

examine Reich's contention that high white female participation has hurt the differential because it usually adds to a family income, whereas a black woman's income is the family income. It is expected that this variable will be positive and significant.

The independent variable mean assistance is used to test Murray's theory that government assistance hurts the black/white income differential, and Wilson's contradicting contention that it has no significant effect. If Murray is correct, the coefficient to MASSIST will be negative and significant. If Wilson is correct, it will be statistically insignificant.

Separate regressions have been run to test the effect of unionization on the black/white income differential because the data is limited to the 94 largest cities. Marshall, Briggs, King, Ashenfelter, Hyclak and Stewart, as noted in the literature review, all have found a positive and significant relationship between unionization and the black/white income differential.

V. Empirical Model and Results

For the initial hypothesis two areas were included in building the model to test the causes of differences in human capital investment between blacks and whites: 1) a variable to measure cultural differences, especially family structure and 2) variables to measure market structure. The basic model is specified as follows:

$$BWMEDEDR = a + b1(FHEADDIF) + b2(PERDUR) + b3(PGOV) + b4(DURDIF) + b5(GOVDIF) + b6(BWPOPR)$$

Each variable as defined in Table 1 was also examined from a race specific point of view to determine if some of the variations

Table 1. Regression Results for Selected Samples: Black/White Median Education Ratio: 1979 (t statistics in parentheses

Variable Name	Total Sample	West Sample	North Sample	South Sample
FHEADDIF	-0.01	-0.17*	-0.01	-0.19**
	(-1.00)	(-1.93)	(-0.94)	(-0.23)
PERDUR	0.51**	0.23*	0.01	0.21**
	(2.14)	(1.74)	(0.23)	(2.30)
PGOV	0.01	0.06	0.01	-0.02
	(0.28)	(0.36)	(0.60)	(-0.23)
DURDIF	-0.04	-0.16	-0.06	0.08
	(-0.64)	(-0.73)	(-0.93)	(0.13)
GOVDIF	0.03	0.05	-0.05	0.40***
	(1.56)	(0.80)	(-0.60)	(2.81)
BWPOPR	-0.17***	0.11	-0.11***	-0.12***
	(-8.71)	(0.83)	(-2.72)	(-3.86)
Constant	0.97***	0.96***	0.98***	0.94***
Adj. R-Squared	0.291	0.056	0.0549	0.233
Sample Size	239	39	101	99

* Significant at the .10 level.
** Significant at the .05 level.
*** Significant at the .01 level.

Table 5. Regression Results for Selected Samples: White
Median Education: 1979 (t statistics in parentheses)

Variable Name	Total Sample	West Sample	North Sample	South Sample
PWFHEAD	0.15	4.91	0.13	-1.69
	(0.77)	(1.38)	(0.63)	(-0.93)
WDURP	-0.50**	0.59	-0.25	-1.23**
	(-1.99)	(0.85)	(-0.59)	(-2.26)
WPGOV	1.59***	1.00	1.92***	1.67***
	(4.36)	(1.08)	(2.69)	(3.98)
BWPOPR	-0.26**	-0.48	0.85**	-0.07
	(-2.03)	(-0.54)	(2.40)	(-0.46)
Constant	12.39***	12.02***	12.19***	12.51***
Adj. R-Squared	0.124	-0.034	0.166	0.197
Sample Size	239	39	101	99

* Significant at the .10 level.
** Significant at the .05 level.
*** Significant at the .01 level.

Table 6. Regression Results for Selected Samples: Black Median Education: 1979 (t statistics in parentheses)

Variable Name	Total Sample	West Sample	North Sample	South Sample
BBFHEAD	-0.14	-3.60***	-0.11	-1.59
	(-0.99)	(-2.98)	(-1.25)	(-1.47)
BDURB	0.01	1.55	-0.46	1.67
	(0.04)	(1.57)	(-1.14)	(1.33)
BPGOV	0.31**	-0.36	-0.04	2.93***
	(2.07)	(-1.26)	(-0.06)	(2.88)
BWPOPR	-2.24***	1.89	-0.58	-1.60***
	(-8.13)	(0.96)	(-1.20)	(-3.94)
Constant	12.19***	13.34***	12.29***	11.44***
Adj. R-Squared	0.241	0.153	0.003	0.173
Sample Size	239	39	101	99

* Significant at the .10 level.
** Significant at the .05 level.
*** Significant at the .01 level.

could be attributed to either blacks or whites. These models are specified as follows:

WMED = a + b1(PWFHEAD) + b2(WDURP) + b3(WPGOV) + b4(BWPOPR)

BMED = a + b1(PBFHEAD) + b2(BDURP) + b3(BPGOV) + b4(BWPOPR)

Each of these models was run for the entire sample of 239 SMSAs, and then again for three broad regions-- North, South, and West The states in each region are listed in Table 1.

The results of the regressions which test Hypothesis 1 are reported in Tables 4, 5, and 6. Regression results for Hypothesis 2 are reported in Tables 7, 8, and 9. Regression results limited by the union variable are reported in Tables 10, 11, 12, 13, 14, and 15.

In the regressions for Hypothesis 1, the proxy for family structure, FHEADDIF, shows no significance in the United States as a whole in predicting the median number of years of schooling that blacks attain relative to whites. Therefore, it is not possible to accept our research hypothesis that a high ratio of black female-headed households relative to whites would have a negative affect on the black/white median education ratio. Yet at the regional level there is weak evidence of a negative relationship between educational achievement and family structure in the West and the South as shown in Table 4.

The proxies to measure market structure; PERDUR, DURDIF, GOVDIF, and PGOV, had little effect on black/white median education ratios with the exception of PERDUR. The positive and significant result indicates that cities with a high percentage of total employment in the manufacturing area increases the

educational achievement of blacks relative to whites. Therefore, the research hypothesis must be rejected. This thesis had hypothesized that high intensity of manufacturing would have a negative effect on the black/white median education variable. The explanation for this may be rooted in the practice of the manufacturing industry of hiring high school graduates. Because the median years of school achieved by a black is less than that required to graduate (Table 2) the presence of available manufacturing jobs and good wages could be enough to keep a black person in high school, but provide no incentive for further human capital investment. But when examining the race specific regression in Table 6, the manufacturing industry does not have a significant effect on black educational achievement. This is not true of whites. When the race specific regression is examined (Table 5) the presence of durable goods manufacturing has a significant and negative effect on white educational achievement. The median years of school achieved by a white is more than that required to graduate as shown in Table 2. This indicates that whites in cities with high intensity manufacturing realize that a high school diploma is enough to earn a good income and lose the incentive to invest in further training. Therefore, the positive effect of durable goods manufacturing on the black/white median education ratio is actually because whites are adversely affected, not because blacks are positively affected.

The variable BWPOPR is negative and significant at the .01 level not only in the United States as a whole, but also in the North and the South. These results are consistent with what was

hypothesized. The negative coefficient indicates that with a concentration of blacks in an SMSA, human capital investment decreases. This supports Wilson's theories of the underclass which states that those left in the SMSAs are low achievers, and that their problems are perpetuated by bad schools (or no school) and lack of role models because those who do achieve leave the SMSA for the suburbs. When race specific regressions are run, BWPOPR is a significant and negative variable for BOTH blacks and whites though the magnitude of the coefficient is significantly less for whites than blacks. This indicates that SMSA with a high black/white population ratio lessens not only black educational investment, but white investment, also, in the United States as a whole.

For the second hypothesis the model is specified as follows:

$$BWFAMINR = a + b1(BWMEDEDR) + b2(BWFLFPRD) + b3(BWFHEADR) + b4(PERDUR) + b5(PGOV) + b6(DURDIF) + b7(GOVDIF) + b8(BWPOPR)$$

Results for this regression are shown in Table 7. Each variable, as defined in Table 1, is also examined in race specific regressions. They are specified as follows:

$$WFAMIN = a + b1(WFLFPR) + b2(PWFHEAD) + b3(WDURP) + b4(WPGOV) + b5(BWPOPR) + b6(WMED)$$

$$BFAMIN = a + b1(BFLFPR) + b2(PBFHEAD) + b3(BDURP) + b4(BPGOV) + b5(BWPOPR) + b6(BMED)$$

Results for these regressions are shown in Tables 8 and 9, respectively.

In conjunction with the first hypothesis which examines what

Table 7. Regression Results for Selected Samples: Black/White Family Income Ratio: 1979 (t statistics in parentheses)

Variable Name	Total Sample	Total Sample	West Sample	North Sample	South Sample
BWMEDEDR	0.42***	0.52***	0.138	1.18***	-0.05
	(3.59)	(4.65)	(0.47)	(4.30)	(-0.41)
BWFLFPRD	0.005***	0.005***	0.007***	0.007***	0.003**
	(4.96)	(4.67)	(3.00)	(3.32)	(1.95)
BWFHEADR	-0.005***	-0.004***	-0.02	-0.004*	-0.047***
	(-3.16)	(-2.91)	(-1.47)	(-1.95)	(-5.25)
PERDUR	0.05	0.05	0.24	0.35	0.26**
	(1.06)	(1.08)	(1.18)	(0.61)	(2.39)
PGOV	-0.001	0.007	-0.03	0.00	-0.17**
	(-0.05)	(0.186)	(-0.11)	(-0.06)	(-1.95)
DURDIF	0.38***	.39***	-0.06	0.56***	0.30
	(3.69)	(4.16)	(-0.18)	(3.31)	(1.38)
GOVDIF	-0.086***	-.09***	-0.03	-0.34	-0.01
	(-2.79)	(-2.97)	(-0.31)	(-1.54)	(-0.07)
BWPOPR	-0.049	-0.09**	-0.07	-0.09	-0.11**
	(-1.09)	(-2.24)	(-0.37)	(-0.83)	(-2.17)
POP (X 1000)	0.00				
	(-0.48)				
MASSIST(X 1000)	-0.0036**				
	(-2.26)				
REGION NORTH	-0.014				
	(-1.03)				
REGION SOUTH	-0.05***				
	(-2.81)				
Constant	0.3224**	0.132	0.525*	-0.572**	0.814***
Adj. R-Squared	0.388	0.375	0.471	0.363	0.413
Sample Size	239	239	39	101	99

* Significant at the .10 level.
** Significant at the .05 level.
*** Significant at the .01 level.

Table 8. Regression Results for Selected Samples: White Family Income: 1979 (t statistics in parentheses)

Variable Name	Total Sample	Total Sample	West Sample	North Sample	South Sample
WMED	5478.15***	6294.58***	4260.74***	6824.48***	4998.39***
	(11.50)	(12.29)	(2.60)	(10.31)	(6.73)
WFLFPR	159.65***	151.40***	316.04***	63.35	173.30***
	(6.49)	(5.39)	(4.11)	(1.56)	(5.07)
PWFHEAD	-1356.09	607.57	16862.97	-355.24	-20917.52
	(-1.10)	(0.43)	(0.58)	(-0.31)	(-1.60)
WDURP	189.35	8425.23***	7435.14	-663.92	-1992.40
	(0.10)	(4.689)	(1.32)	(-0.27)	(-0.50)
WPGOV	-15815.4***	-15827.6***	440.39	-20655.36***	-17128.19***
	(-6.64)	(-5.9)	(0.059)	(-4.90)	(-5.44)
BWPOPR	3994.25***	2489.65***	1653.15	8941.95***	3441.99***
	(4.18)	(2.69)	(0.236)	(4.29)	(3.32)
POP (X 1000)	0.20*				
	(1.79)				
MASSIST(X 1000)	984.93**				
	(2.55)				
REGION NORTH	1830.49***				
	(4.86)				
REGION SOUTH	-76.54				
	-0.17				
Constant	-56764***	-64528.97***	-52123.87***	-63959.28***	-46891.40***
Adj. R-Squared	0.674	0.561	0.57	0.688	0.544
Sample Size	239	239	39	101	99

* Significant at the .10 level.
** Significant at the .05 level.
*** Significant at the .01 level.

Table 9. Regression Results for Selected Samples: Black Family Income: 1979 (t statistics in parentheses)

Variable Name	Total Sample	Total Sample	West Sample	North Sample	South Sample
BMED	713.36***	1320.67***	752.17	3056.89***	195.84
	(3.47)	(6.62)	(1.06)	(6.35)	(1.06)
BFLFPR	189.67***	162.72***	217.34***	140.67***	140.89***
	(10.05)	(7.98)	(3.92)	(4.65)	(5.55)
PBFHEAD	-1082.48***	-721.81*	-1761.98	-604.78	-6745.39***
	(-2.86)	(-1.75)	(-0.378)	(-1.52)	(-3.45)
BDURP	5749.17***	7778.5***	5295.98	9860.73***	1743.51
	(5.53)	(8.13)	(1.54)	(5.40)	(0.77)
BPGOV	-1020.7**	-1347.25***	-877.83	5732.56*	-5003.54***
	(-2.33)	(-2.99)	(-0.89)	(1.88)	(-2.54)
BWPOPR	2663.87***	747.38	-3959.5	6120.87***	1844.93**
	(2.82)	(0.80)	(0.59)	(2.80)	(2.27)
POP (X 1000)	0.15				
	1.39				
MASSIST(X 1000)	389.65				
	(1.08)				
REGION NORTH	190.42				
	(0.54)				
REGION SOUTH	-1591.76***				
	(-3.55)				
Constant	-6918.50***	12276.35***	-7203.82	-34417.79***	4570.35*
Adj. R-Squared	0.607	0.52	0.561	0.531	0.424
Sample Size	239	239	39	101	99

* Significant at the .10 level.
** Significant at the .05 level.
*** Significant at the .01 level.

factors influence human capital investment, the second hypothesis considers how much influence this investment has on the black/white income differential. The regression results shown in Table 7 indicate that the black/white median education ratio has a positive and highly significant effect on the black/white income differential. This result allows hypothesis 2 to be accepted in the area of human capital investment. When median educational achievement is examined in race specific regressions (Tables 8 and 9) it is shown that education is positive and significant for both blacks and whites. But the coefficient for whites is almost five times higher than for blacks. This indicates that human capital investment is important for both blacks and whites, but the return on this investment is significantly greater for whites.

Most of the non-educational independent variables had a statistically significant effect on the black/white income differential with the exception of PERDUR and PGOV. PERDUR, which measures the intensity of manufacturing in an SMSA, is insignificant in the entire sample, therefore the hypothesis that PERDUR is directly related to the black/white income differential cannot be accepted. This finding does not support Seeborg's results for the Great Lakes regional study where PERDUR was a significant predictor of the differential. This may indicate that trends in the area of manufacturing intensity are not the same throughout the United States. Also in the area of market structure is the variable DURDIF, which measures the difference in concentration between blacks and whites in durable

goods manufacturing. This variable is significant and positive at the one percent level. This indicates that if manufacturing employment is readily available to blacks there is a positive and significant effect on BWFAMINR. Therefore industrial structure of an SMSA does effect the black/white income differential, but only in its availability, not its intensity.

The independent variable PGOV also has no significant effect, on the black/white income differential, therefore this part of the second hypothesis must be rejected. These results also disprove Reich's (pg128) theory that government employment helps the black/white income differential is incorrect. When PGOV is viewed in the race specific regressions it is highly significant and negative for both blacks and whites, but the intensity of the coefficient almost ten times higher for whites than for blacks. A possible explanation for the negative coefficients is that both blacks and whites could earn more in the private sector, but if they cannot get these jobs, they must turn to government employment, where wages are not as high. Because of the difference in the coefficients, whites obviously receive a better return in the private sector than blacks, therefore, public employment is a more negative step for whites. Also, during the time of the Census, CETA was operating, and people were filtered into public employment and these government jobs frequently paid only minimum wage.

The independent variable BWFLFPRD is highly significant and positive in its effect on the black/white income differential. This is the hypothesized result. When examining the race

specific regressions in Tables 8 and 9, this variable is highly significant and positive for both blacks and whites and the coefficients are of similar magnitude. The closeness in the magnitude of the coefficients indicates that white and black women receive similar returns when they participate in the work force.

Becker's theory of discrimination is supported by the results of the regression for the second hypothesis (Table 7.) The variable BWPOPR is negative and significant at the five percent level for the entire sample. This is the hypothesized result-- the black/white population ratio has a negative effect on the black/white income differential. When the BWPOPR is examined in race specific regressions, Tables 8 and 9, one can see that the negative and significant effect the ratio has on the income differential actually results from whites earning more in SMSAs with a high black/white population ratio, not from blacks earning less in these SMSAs. This may indicate that Becker(1957) was incorrect when he hypothesized that a competitive market would lessen discrimination. The positive effect of BWPOPR on white incomes indicates that employers are indeed still willing to pay higher wages to obtain white workers, yet they have managed to stay profitable through the years.

The black/white income differential is negatively effected by a high percentage of female headed households in an SMSA (Table 7.) This is the hypothesized result. This is strongly supportive of Wilson's underclass concept and indicates that his figures that contend that a large portion of families in poverty

are headed by women are correct (pg27).

In a more comprehensive regression than those discussed in this thesis, the variable MASSIST was included to measure the effect government assistance has on the black/white family income ratio (Tables 7, 8, and 9.) The variable is significant at the five percent level and negative in its effect on the black/white income differential. But when examining the coefficient for MASSIST, one can see that is quite small. When the results for MASSIST are examined (Tables 8 and 9) there is a positive and significant effect on white family incomes, but no significant effect on black incomes. This contradicts Murray who claims that government transfer payments have hurt blacks.

To measure the variable unionization, separate regressions were run because the data is limited to the 94 largest SMSAs. The variable PUNION measures the percent of employed persons in unions in that SMSA, whereas PRDUNION measures the percent of employed persons in production unions in that SMSA. The data was gathered from the Industrial and Labor Relations Review (1979). The models are as follows:

$$BWFAMINR = a + b1(BWMEDEDR) + b2(BWFLFPRD) + b3(FHEADDIF) + b4(BWPOPR) + b5(PRDUNION)$$

$$BWFAMINR = a + b1(BWMEDEDR) + b2(BWFLFPRD) + b3(FHEADDIF) + b4(BWPOPR) + b5(PUNION)$$

Each of these models was also run in race specific regressions. The models are as follows:

$$WFAMIN = a + b1(WMED) + b2(WFLFPR) + b3(PWFHEAD) + b4(BWPOPR) + b5(PRDUNION)$$

Table 10. Regression Results for the Large SMSA Sample: White Family Income: 1979 (t statistics in parentheses)

Variable Name	Model 1	Model 2
WMED	3649.42***	3655.60***
	(4.73)	(4.70)
WFLFPR	185.74***	198.95***
	(3.58)	(3.75)
PWFHEAD	365.96	581.33
	(0.29)	(0.45)
BWPOPR	3926.17***	4315.88***
	(2.76)	(2.98)
PUNION		122.92***
		(6.11)
PRDUNION	87.21***	
	(6.32)	
Constant	-37020.98***	-37639.87***
Adj. R-Squared	0.48	0.467
Sample Size	94	94

* Significant at the .10 level.
** Significant at the .05 level.
*** Significant at the .01 level.

Table 11. Regression Results for the Large SMSA Sample: Black Family Income: 1979 (t statistics in parentheses)

Variable Name	Model 1	Model 2
BMED	1306.33***	1371.17***
	(2.99)	(3.32)
BFLFPR	228.21***	241.22***
	(5.77)	(6.31)
PBFHEAD	-7385***	-7457.91***
	(-2.86)	(-2.87)
BWPOPR	1260.63	1913.77
	(0.89)	(1.39)
PUNION		122.21***
		(6.38)
PRDUNION	79.42***	
	(5.56)	
Constant	-14866.95***	16654.59***
Adj. R-Squared	0.528	0.564
Sample Size	94	94

* Significant at the .10 level.
** Significant at the .05 level.
*** Significant at the .01 level.

Table 12. Regression Results for the Large SMSA Sample: Black/White Family Income Ratio: 1979 (t statistics in parentheses)

Variable Name	Model 1	Model 2
BWMEDEDR	0.78***	0.74***
	(4.11)	(3.96)
BWFLFPRD	0.01***	0.01***
	(5.34)	(5.48)
BWFHEADR	-0.02**	-0.02***
	(-2.39)	(-2.65)
BWPOPR	-0.10*	-0.09*
	(-1.96)	(-1.87)
PUNION		-.001*
		(1.77)
PRUNION	0.00	
	(0.88)	
Constant	-0.10	-0.06
Adj. R-Squared	0.511	0.524
Sample Size	94	94

* Significant at the .10 level.
** Significant at the .05 level.
*** Significant at the .01 level.

$$WFAMIN = a + b1(WMED) + b2(WFLFPR) + b3(PWFHEAD) + b4(BWPOPR) + b5(PUNION)$$

$$BFAMIN = a + b1(BMED) + b2(BFLFPR) + b3(PBFHEAD) + b4(BWPOPR) + b5(PRDUNION)$$

$$BFAMIN = a + b1(BMED) + b2(BFLFPR) + b3(PBFHEAD) + b4(BWPOPR) + b5(PUNION)$$

The effect of unionization in general on the black/white income differential is negative and significant at the ten percent level. Membership in production unions has no significant effect on the income differential. Both of these results, as shown in Table 10, cause the hypothesis to be rejected. Hyclak and Stewart, using 1970 data on 49 SMSAs, had concluded that unionization has a statistically significant and positive effect on the differential (pg 311). In effort to more closely replicate Hyclak and Stewart's data base, the union regressions were run again, this time using earnings, not income, as the dependent variable. Earnings is a more correct dependent than income because union membership would not affect outside sources of income such as property holdings, government transfers, and inheritances. This change had surprising results. The black/white earnings ratio is positively and significantly affected by PUNION and PRDUNION. The results (Tables 13, 14, and 15) are highly supportive of Hyclak and Stewart. PUNION has twice the effect of PRDUNION which indicates that cities with overall high unionization rather than just high production unionization have a smaller black/white earnings ratio. The overall result agrees also with Ashenfelter who believes unions

Table 13. Regression Results for the Large SMSA Sample: White Earnings: 1979 (t statistics in parentheses)

Variable Name	Model 1	Model 2
WMED	3039.46***	3034.87***
	(3.84)	(3.77)
WFLFPR	123.92**	134.22**
	(2.32)	(2.44)
PWFHEAD	-254.88**	-253.56**
	(-2.18)	(-2.13)
BWPOPR	36.34**	39.41***
	(2.49)	(2.64)
PUNION		110.23***
		(5.30)
PRDUNION	80.41***	
	(5.66)	
Constant	-22802.21**	-23057.09**
Adj. R-Squared	0.384	0.363
Sample Size	94	94

* Significant at the .10 level.
** Significant at the .05 level.
*** Significant at the .01 level.

Table 14. Regression Results for the Large SMSA Sample: Black Earnings: 1979 (t statistics in parentheses)

Variable Name	Model 1	Model 2
BMED	972.28**	1079.07***
	(2.35)	(2.74)
BFLFPR	174.66***	184.33***
	(4.66)	(5.05)
PBFHEAD	-33.68	-27.58
	(-1.30)	(-1.11)
BWPOPR	18.98	25.58*
	(1.41)	(1.94)
PUNION		133.13***
		(7.27)
PRPUNION	90.03***	
	(6.64)	
Constant	-7808.10	-9886.83**
Adj. R-Squared	0.456	0.490
Sample Size	94	94

* Significant at the .10 level.
** Significant at the .05 level.
*** Significant at the .01 level.

Table 15. Regression Results for the Large SMSA Sample: Black/White Earnings Ratio: 1979 (t statistics in parentheses)

Variable Name	Model 1	Model 2
BWMEDEDR	0.31*	0.293*
	(1.95)	(1.91)
BWFLFEED	0.003***	0.003***
	(2.91)	(3.02)
BWFHEADR	-0.013	-0.013*
	(-1.62)	(-1.82)
BWPOPR	-0.001***	-0.001***
	(-3.01)	(-2.91)
PUNION		0.002***
		(4.60)
PRDUNION	0.001***	
	(3.58)	
Constant	0.411***	0.428***
Adj. R-Squared	0.416	0.46
Sample Size	94	94

* Significant at the .10 level.
** Significant at the .05 level.
*** Significant at the .01 level.

help blacks, but contradicts his finding that industrial unions are more helpful than craft unions. When examining the coefficients for the race specific regressions (Tables 14 and 15) one can see that a one percent rise in production union membership in an SMSA results in a $90.03 earnings increase for blacks, but only an $80.41 increase for whites. It is important to note though that blacks and whites both benefit from production union membership. General union membership has an even more positive affect on black and white incomes, $133.13 and $110.23 respectively. Combined with the findings of Marshall, Briggs, and King (5th edition) that blacks tend to be over represented in unions, unionization becomes an important determinant in black/white earnings ratio. Unfortunately, union membership has started to decline. Because blacks benefit most from union membership, this decline will, ceritus paribus, lower black incomes relative to white incomes.

In the union regressions, the other variables acted similar to the regression which included all 239 SMSAs.

VI. Conclusion and Policy Implications

The two-fold purpose of this thesis was to discover what factors influence human capital investment and how human capital investment and other factors influence the black/white income differential.

The results for the first hypothesis which tested variables influencing the relative educational achievement of blacks to

whites found family structure had little effect on educational achievement. Neither did government employment. The two variables that do affect black human capital investment relative to white are BWPOPR and PERDUR.

The black/white population ratio has a negative and significant effect on both black and white incomes (Tables 4, 5, and 6.) This negative effect, though, is approximately eight and a half times larger for blacks than whites. This supports Wilson's underclass theory that large concentrations of low income minorities results in the development of a self-reproducing "underclass." If blacks receive a poor education, they have no skills to remove themselves from the underclass neighborhoods, and this is true with their children and grandchildren, etc. This indicates that cities with high black/white population ratios need to pay special attention to the schools-- perhaps lessen the student/teacher ratio, provide incentive for "good" teachers to come and stay there, and incentives for students to stay in school.

The other factor that was significant in predicting black human capital investment relative to white is PERDUR, which measures the percentage of durable goods manufacturing in a city. This variable, which showed positive and significant for the ratio (Table 4), actually proved to have a negative influence on white human capital investment and no significant affect on blacks (Tables 5 and 6.) Cities with high manufacturing simply do not require high levels of education. But over the past couple of decades, as employment in manufacturing has declined,

this requirement has and will continue to change. Manufacturing jobs that are available are now requiring computer, electronic, and other skills. A Hudson Institute study has determined that median education requirements will have increased by at least eight tenths of a year in the 1980's (Marshall, pg217.) This reinforces the idea that increasing emphasis needs to be placed on education, especially in those SMSAs where manufacturing is a significant part of the economy.

There is still a gap between white and black education and changes need to be made to bridge the gap, but Buchele (1982) has found that the education gap between blacks and whites has narrowed, but a much larger gap exists between black and white earnings.

This leads us directly to the results of hypothesis 2 which tested the significance of education and other factors on the black/white income differential.

In Tables 8 and 9, the black and white benefits from educational investment are measured in dollars. The coefficients for WMED and BMED are $6294.58 and $1320.67 respectively. This agrees with Buchele's findings that, although the education gap has narrowed, this has not had as great an effect on the black/white income differential as one would expect. The reason is that returns are only one-fifth as great for blacks as for whites. What causes this difference in returns is difficult to determine. It could be the underclass problem in which the minorities living in these underclass neighborhoods do not hear about available jobs outside their area. Even if a member of

this group managed to graduate and perhaps take some vocational training, according to Wilson, she/he would still not have the same chances of capturing a "good" job as a person who is not handicapped by living in an underclass neighborhood because the flow of job information does not extend into these areas. Only a small percentage of jobs are actually advertised in newspapers which may be the only source a person has for finding a job. This difference in return on education could very well be the answer to the question: Why is there such a large gap between black and white incomes? But the answer that they do not get the same returns on education leaves another question: Why don't blacks receive the same return on education that whites do? The underclass theory is one possibility, but probably not the only answer. This is an issue that definitely needs further exploration.

Another area where blacks and whites differ is in returns to durable goods manufacturing employment. The difference is slight, however, with coefficients of $84.25 and $77.79 for whites and blacks respectively. This could be a result of the difference in median age between blacks and whites. The median white age in an SMSA is anywhere from seven to ten years greater than the median black age. This would put white durable goods employees higher on the seniority list which usually means slightly higher pay. This variable does indicate that an SMSA that can attract durable goods manufacturing can increase the median family incomes of both its black and white citizens.

A variable less able to be controlled by an SMSA is the

number of female-headed households. Strongly supportive of Wilson's (1987) theory of the underclass is the negative and significant coefficient for BWFHEADR, which compares the percent of black female-headed households to the percent of white female-headed households. But Wilson is not supported by the figures in this thesis in the area of government assistance. Wilson believes that transfer payments are not significant. Murray's (1984) supposition that transfer payments have a negative and significant impact is not supported by this study. In the race specific regressions (Tables 8 and 9) MASSIST is not a significant determinant in black incomes and has a positive effect on white incomes. It is disturbing, however, to find MASSIST has a more favorable effect on white incomes than on black incomes when these programs are designed to help minorities. This thesis examines only the effect that MASSIST has on median family incomes. Because of this, the results are difficult to assign importance to because MASSIST is most likely to have an effect on those at the lower end of the income spectrum, not those in the middle.

The variable female labor force participation rates has a positive bearing on the future. An increase in this rate not only helps the BWFAMINR, but helps both black and white family incomes. This positive and significant variable shows only a slight difference ($0.11) between black and white benefits from a one percent increase in female labor force participation. This variable has good future trends because the female labor force participation rate has increased and seems to be continuing to do

so. Though the rise will not have a large influence in the black/white income differential, it still has a positive effect.

The negative result government employment has on the differential and on black and white incomes (Tables 7, 8, and 9) indicates less government employment is desirable in an SMSA if one wants to improve the differential and both black and white incomes. Because CETA, which was active at the time of the 1979 Census, employed persons through the government at minimum and low wages, it is expected that this variable will see significant improvement after the effects of JTPA are felt. Because JTPA promotes training and employment in higher paying private sector jobs, many of the low paying public sector jobs have vanished, leaving what Reich (pg 128) describes as low and middle-level white collar jobs that are common with government employment. Reich's theory that government employment will help the differential was disproved with this data, but perhaps with 1990 Census data would prove correct.

The variable BWPOPR acted as Becker predicted, it had a negative and significant effect on the black/white income differential (Table 7.) But the reason (Tables 8 and 9) is that whites do significantly better in SMSAs with high black/white population ratios, not that blacks do worse.

The final variable examined in relation to the black/white income differential is unionization. The strong results of unionization when used with the dependent variable earnings (Tables 13, 14, and 15) indicates that Hyclak and Stewart's 1970 findings that unionization helps the differential still holds

true in 1980. The positive significance of this variable suggests that the government needs to help promote unions in the face of rapidly declining membership-- perhaps to revise right-to-work laws so that they encourage workers to join union, perhaps to support worker solidarity by urging companies to bargain with union leaders before strikes are necessary which would eliminate the negative image unions have of causing strikes. Also, there is a rise in the number of white collars workers, which embraces many government jobs. If the government would encourage the formation of these union, other companies might realize the importance of unions for white collar workers. Any policy that puts a positive light on unions and shows the benefits of unionization would help both the black/white income differential and black and white family incomes.

Future research indicated by the results of this thesis are especially strong in the area of black and white educational returns. Why is this difference so great? Would the lessening of this difference in educational returns reduce the black/white income differential? Also, with the approach of the 1990 Census, research possibilities indicate a study similar to this to determine how much influence the reduction of durable goods manufacturing has had on the black/white income differential. The opportunity to expand a cross-sectional study like this into a longitudinal study offers endless opportunity for exploration into trends in regions of the United States as well as trends for the United States as a whole.

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